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ARMY AVIATION TEST BOARD FORT RUCKER ALA  
PRODUCT-IMPROVEMENT TEST (PHASE II), JETCAL TESTER, MODEL H119A--ETC(U)  
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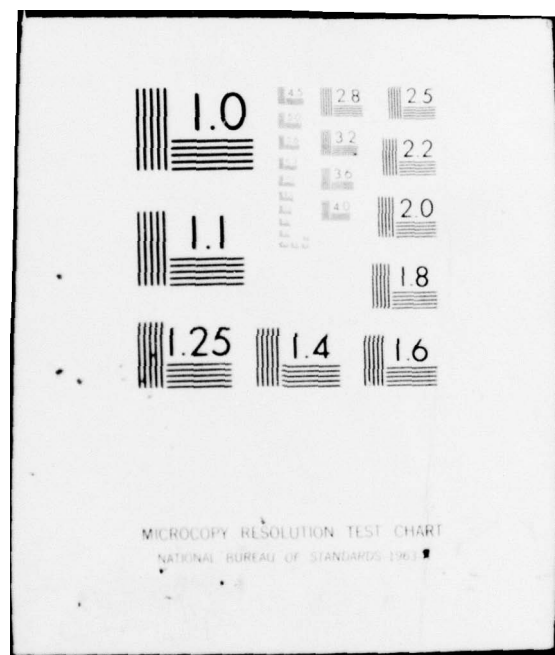
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DEPARTMENT OF THE ARMY  
UNITED STATES ARMY AVIATION TEST BOARD  
Fort Rucker, Alabama 36360

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16 USATECOM-4-6-50011-03

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6 MAR 5 1969

SUBJECT: ~~Final Report of~~ Product-Improvement Test (Phase II),  
Jetcal Tester, Model H119A, USATECOM Project No.  
4-6-5011-03

9 Final rept.

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1. REFERENCES

See Inclosure 1.

2. BACKGROUND

Two deficiencies existed during earlier testing of the Jetcal Tester, Model H119A, (reference 7) resulting from the lack of necessary test item components. These components were provided for testing and the US Army Test and Evaluation Command directed the US Army Aviation Test Board to conduct a supplemental product-improvement test of the components (reference 8).

3. DESCRIPTION OF MATERIEL

a. Continuity heater probe, part number (P/N) BH3810-40, is a special-function probe designed to apply heat individually to exhaust gas temperature (EGT) thermocouples to determine whether all thermocouples are operating. Application of the pre-heated probe to a properly operating thermocouple causes a slight temperature increase on the aircraft EGT indicator.

b. TEMPCAL heater probe, P/N BH1278, is a clamp-type heater probe designed to check operation of continuous-loop-type overheat (fire warning) detectors under heated conditions. Application of

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temperature equal to the aircraft system fire warning trip point causes the fire warning light to activate.

#### 4. OBJECTIVE

To determine the capability and suitability of the two additional test item components for accomplishment of intended functions.

#### 5. SUMMARY OF RESULTS

a. The continuity heater probe performed its intended function satisfactorily.

b. The TEMPCAL heater probe satisfactorily checked operation of CH-47( ) helicopter fire detection systems.

c. The TEMPCAL heater probe would not activate the UH-1( ) helicopter fire detector system warning light within tolerances prescribed by technical manuals.

d. The TEMPCAL heater probe was not compatible with OV-1( ) aircraft fire detection systems.

#### 6. DISCUSSION

a. The service manual instructions for continuity testing of EGT thermocouples specify use of the special continuity heater probe (reference 3). However, after examination and use of this probe, test personnel found that continuity testing could be accomplished using the standard heater probe (P/N BH996-40) furnished with the Jetcal Tester. Therefore, the continuity probe is not considered essential. The service manual should be revised to show that continuity testing can be accomplished using either the P/N BH996-40 or the P/N BH3810-40 probe.

b. The present UH-1( ) helicopter fire detection installation is not satisfactory, and a study is being conducted to determine the

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requirements for a fire detection system on UH-1( ) helicopters. No further effort will be expended on the present system. (See Inclosure 2.)

c. TM 55-1520-series organizational maintenance manual instructions for checking fire detection systems of UH-1( ) helicopters (references 2, 4, and 5) specify use of the TEMPCAL heater probe. Since satisfactory system checks cannot be accomplished, these instructions are erroneous and should be revised.

d. OV-1( ) aircraft fire detection systems are checked by methods other than application of predetermined heat and require the use of specialized test equipment.

## 7. CONCLUSIONS

a. The TEMPCAL heater probe is suitable for checking CH-47( ) helicopter fire detection systems.

b. The TEMPCAL heater probe is not suitable for checking UH-1( ) and OV-1( ) aircraft fire detection systems.

c. The TM 55-1520-series organizational maintenance manual instructions for fire detection system testing of UH-1( ) helicopters are erroneous.

d. The continuity heater probe is not essential for continuity testing of EGT thermocouples.

e. The service manual instructions for continuity testing of EGT thermocouples are inaccurate.

## 8. RECOMMENDATIONS

a. The TEMPCAL heater probe be provided as a standard component of the Jetcal Tester when issued to units having organic CH-47( ) helicopters.



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b. No further consideration be given to the TEMPCAL heater probe as a potential tester of UH-1( ) and OV-1( ) aircraft fire detection systems.

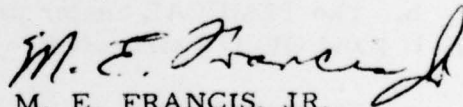
c. The TM 55-1520-series organizational maintenance manual instructions for checking fire detection systems of UH-1( ) helicopters be deleted.

d. The continuity heater probe be considered a non-essential component of the Jetcal Tester.

e. The service manual instructions for continuity testing of EGT thermocouples be revised to show that the P/N BH996-40 heater probe can be used as well as the continuity heater probe, P/N BH3810-40.

FOR THE PRESIDENT:

2 Incl  
as

  
M. E. FRANCIS, JR.  
CPT, AGC  
Adjutant

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### REFERENCES

1. Technical Manual 55-1510-204-35, "DS, GS and Depot Maintenance Manual, OV-1 Aircraft," November 1965, with Change 2, 22 May 1967.
2. Technical Manual 55-1520-210-20, "Organizational Maintenance Manual, Army Model UH-1D and UH-1H Helicopter," June 1967, with Change 4, 20 November 1967.
3. "Service Manual for Automatic Jetcal Engine Trimmer, H119A," Howell Instruments, Inc., Fort Worth, Texas, 21 December 1967.
4. Technical Manual 55-1520-219-20, "Organizational Maintenance Manual, Army Model UH-1B Helicopter," January 1968.
5. Technical Manual 55-1520-220-20, "Organizational Maintenance Manual, Army Model UH-1C Helicopter," January 1968.
6. Technical Manual 55-1520-227-20, "Organizational Maintenance Manual, Army Model CH-47B and CH-47C Helicopters," February 1968.
7. Final Report, USATECOM Project Number 4-6-5011-02, "Product Improvement Test of Automatic Jetcal Tester, Model H119A," US Army Aviation Test Board, 12 September 1968.
8. Letter, AMSTE-BG, Headquarters, US Army Test and Evaluation Command, 11 October 1968, subject: "Test Directive, Product Improvement Test (Phase II), Jetcal Tester, Model H119A."

INCLOSURE 1

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RECOMMENDED CHANGES TO DA PUBLICATIONS							DATE	
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(Forward directly to addressee listed in manual.)					FROM: (Activity and location)			
Commanding General U. S. Army Aviation Materiel Command ATTN: AMSAV-M P. O. Box 209, Main Office St. Louis, Missouri 63166					President U. S. Army Aviation Test Board Fort Rucker, Alabama 36360			
PART I - REPAIR PARTS AND SPECIAL TOOL LISTS AND SM's								
PUBLICATION NUMBER				DATE		TITLE		
PAGE NO.	COL NO.	LINE NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	CHECK ONE			ACTION RECOMMENDED	
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REMARKS (Any remarks or recommendations not covered, such as errors on illustrations. Also any general suggestions or recommendations for improvement of repair parts and special tool lists. Additional blank sheets may be used if more space is needed.)								
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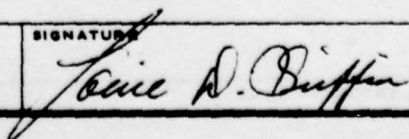
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PART II - TECHNICAL PUBLICATIONS					
PUBLICATION NO.			DATE	TITLE	
TM55-1520-210-20			June 1967 W/Chg 4, 20 Nov 67	Organizational Maintenance Manual Army Model UH-1D and UH-1H Helicopter	
PAGE NO.	PARA-GRAPH	* LINE NO.	FIG. NO.	TABLE NO.	ACTION RECOMMENDED
11-18	11-77	All			Recommend that an investigation be conducted by the aircraft manufacturer to improve the adequacy and/or accuracy of testing procedures of the Fire Detection System. Further recommend that instructions be included on action required if test criteria are not met.
<p>REMARKS (Use this space for any general recommendation for improvement of technical publications. Additional blank sheets may be used if more space is needed.)</p> <ol style="list-style-type: none"> <li>1. There are no procedures listed to determine the insulation resistance value of the fire detector wire (cable) when specified alarm temperatures are applied by use of the Jetcal Tester "Tempcal" Heater Probe.</li> <li>2. Alarm light will not come on within the temperature range specified in the TM(s). During actual check of five (5) UH-1 helicopters, the fire warning light would not come on until an average temperature of <math>404^{\circ}\text{C}</math> was reached. The temperature specified in the TM was <math>220^{\circ}\text{C} \pm 44^{\circ}\text{C}</math>.</li> <li>3. EIR No. 844220 (69-684), dated 8319 has been submitted on the difficulties described in 2, above.</li> <li>4. Described difficulties are also applicable to TM 55-1520-219-20 and TM 55-1520-220-20.</li> </ol>					
* Reference to line numbers within the paragraph or subparagraph.					
DATE		TYPED NAME, GRADE, OR TITLE		SIGNATURE	
18 Nov 1968		L. D. Griffin, Supv., Quality Control Hawthorne Aviation			

AMSAV-R-MEU (C-0181)

1. The present fire warning detection installation is not satisfactory and has been a source of trouble since its original installation. A study is presently being conducted to determine the requirements for a fire detection system on UH-1 Aircraft. No further effort will be expended on the present system.
2. Your continued interest and submission of DA Form 2028 is solicited and appreciated. If we can be of further service or assistance, please advise this Command.

*Bruce E. Wright*  
BRUCE E WRIGHT, Acting Chief  
UH-1/AH-1G Branch  
Tech Data Division  
Directorate of Technical Data,  
Cataloging and Standardization

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